



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/783,179	02/12/2001	Robert Pulford JR.	226-133	6009

21091 7590 06/05/2002

JOHN H CROZIER
1934 HUNTINGTON TURNPIKE
TRUMBULL, CT 06611

EXAMINER

JONES, JUDSON

ART UNIT PAPER NUMBER

2834

DATE MAILED: 06/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/783,179

Applicant(s)

PULFORD, ROBERT

Examiner

Judson H Jones

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 17-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-16 is/are rejected.
- 7) ☒ Claim(s) 5 and 6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-16, drawn to linear stepping motor structure, classified in class 310, subclass 12.
- II. Claims 17 and 18, drawn to a fixture to be used for magnetizing a shaft, classified in class 148, subclass 108 and claims 19-22, drawn to a method for making the shaft of a linear stepping motor, classified in class 29, subclass 598.

The inventions are distinct, each from the other because of the following reasons:

Inventions of group I and of group II are related as product made and as a fixture to be used for a making a product combined with a process for making the product. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the instant invention can be made by another process, such as by using the fixture of Lee et al.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

When a telephone restriction was made to Applicant's representative, the claims were divided into three groups, claims 1-16, claims 17-18, and claims 19-22. The restriction between claims 17-18 and 19-22 has been withdrawn.

During a telephone conversation with John H. Crozier on 5/31/2002 a provisional election was made with traverse to prosecute the invention of group 1, claims 1-16. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure that is not enabling. An element critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). In regard to bearings, Applicant mentions on page 8 lines 28-31 that "First and second surfaces may also provide bearing surfaces for shaft 30 ...". This implies that the bearing surfaces may also be omitted, as recited in claim 13. However, something has to keep the shaft from contacting the movable member for the motor to operate. If not, then the surface of the shaft and the annular pole plates 60, 62, 64, 66 (as described on page 9 lines 1 and 2 of the specification) will act as bearings. The device of Enomoto et al. uses magnetic bearings. Other devices use air bearings. Applicant needs to clarify if the shaft and pole plates are kept apart in his device and the method, if any, by which the shaft and pole plates are kept apart.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 8-10, 12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishiyama et al. in view of Gogue and Onodera et al. Ishiyama et al. discloses a linear motor having an annular fixed member comprising a axially extending, cylindrical, permanent magnet shaft surrounded by an annular movable member as described in column 5 line 60 to column 6 line 15. The shaft is smooth as described in column 3 lines 55-57. Ishiyama et al. does not disclose the variant where the annular magnetic shaft is made movable with the annular member surrounding the shaft being fixed. However, Gogue teaches in column 3 lines 7-23 that either member of a motor can be made fixed and the other member made movable. Since Gogue and Ishiyama et al. are both from the same field of endeavor, it would have been obvious for one of ordinary skill in the art to have made the permanent magnet shaft of Ishiyama et al. movable for an application where the force of the motor needed to be applied at the periphery of the motor. Ishiyama et al. also does not disclose a linear stepper motor. However, Onodera teaches in column 6 lines 36-42 that routine changes in the control system of a linear motor can make the motor into either a stepping motor or a motor capable of continuous movement. Since Onodera and Ishiyama et al. as modified by Gogue are both from the same field of endeavor, it would have been obvious for one of ordinary skill in the art to have made the Ishiyama et al. device into a stepping motor in situations where a step by step movement of the motor was desirable.

In regard to claim 2, see Ishiyama et al. column 44-59. The reference explains that the shaft is hollow and then has a ferromagnetic rod inserted into the shaft.

In regard to claims 3 and 4, after the rod has been inserted into the shaft, then the shaft has a solid core of ferromagnetic material.

In regard to claim 8, Ishiyama et al. does not disclose any means inside the motor which would impede relative rotation of the shaft and the annular member surrounding the shaft.

In regard to claim 9, Ishiyama et al. does not disclose anything which would impede driving the movable member backward.

In regard to claim 10, the linear motor of Ishiyama et al. is inherently capable of operation in any orientation.

In regard to claim 12, see Ishiyama et al. column 6 lines 9-15. Ring-like coils are viewed as being conventionally wound coils. The word "conventional" in this claim seems broad enough to be readable on any coil which exists in the prior art.

In regard to claim 14, Ishiyama et al. shows no lead screw and ball in the device.

In regard to claim 16, Ishiyama et al. discloses no conversion of rotary motion to linear motion.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishiyama et al. as modified by Gogue and Onodera et al. as applied to claim 1 and further in view of Lee et al. Ishiyama et al. describes the rod-like member in column 3 lines 50-57 but does not disclose how the rod-like member is made. However, Lee et al. teaches in column 3 lines 38-50 that magnets made from compressed powder can be extruded as a single piece. Since Lee et al. and Ishiyama et al. as modified by Gogue and Onodera et al. are both from the same field of endeavor and since Ishiyama et al. as modified by Gogue and Onodera does not explain how to make the magnetic shaft, it would have been obvious for one of ordinary skill in the art to have made the magnetic shaft from compressed powder and extruded as taught by Lee et al.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishiyama et al. as modified by Gogue and Onodera et al. as applied to claim 1 above, and further in view of Karidis et al. ((cited by Applicant). Ishiyama et al. as modified by Gogue and Onodera et al. discloses the linear stepping motor but does not disclose modular stator stacks. However, Karidis et al. discloses modular stator stacks in column 4 lines 18-23 and teaches that using modular stacks makes it easy to assemble a motor with enough power to do the intended job. Since Karidis et al. and Ishiyama et al. as modified by Gogue and Onodera et al. are both from the same field of endeavor, it would have been obvious for one of ordinary skill in the art to have utilized modular stator stacks in the device of Ishiyama et al. as modified by Gogue and Onodera et al. in order to make the assembling of motors having varying power easier.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishiyama et al. as modified by Gogue and Onodera et al. as applied to claim 1 above, and further in view of Enomoto et al. Ishiyama et al. as modified by Gogue and Onodera et al. discloses the linear stepping motor but uses bearings in the motor as described in column 6 lines 12-15. However, Enomoto et al. teaches using magnetic bearings in the abstract. Since Enomoto et al. and Ishiyama et al. as modified by Gogue and Onodera et al. are both from the same field of endeavor, it would have been obvious for one of ordinary skill in the art to have utilized magnetic bearings which require no lubrication in the motor of Ishiyama et al. as modified by Gogue and Onodera et al. when the motor was intended for use in a clean room, such as the ones used for semiconductor device fabrication.

Allowable Subject Matter

Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: In regard to claim 5, it is known in the art to strengthen hollow shafts by placing core material in them. Non-ferromagnetic material can be used when electrical and magnetic flux conduction is not desired. However, Ishiyama et al. uses ferromagnetic material because "a high magnetic flux can be obtained, and thus a high driving force can be obtained." No motive has been found for combining Ishiyama et al. with any reference teaching the use of non-ferromagnetic material as a core material for a hollow shaft. In regard to claim 6, the prior art of record does not disclose or teach including annular disks of a high lubricity material in a stator structure, with the disks serving as bearing surfaces for the shaft of the motor.

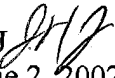
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Judson H Jones whose telephone number is 703-308-0115. The examiner can normally be reached on 8-4:30 M-F.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 703-308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3431 for regular communications and 703-305-3432 for After Final communications.

Application/Control Number: 09/783,179
Art Unit: 2834

Page 8

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JHI 
June 2, 2002


NESTOR RAMIREZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800